

## CLAIMS

1. A method for determining an environmental condition by measuring a composition of a microbial population which has been exposed to said environmental condition.
2. A method for determining changes in an environmental condition by measuring changes in a composition of a microbial population which has been exposed to said changes in an environmental condition.
3. A method for determining an environmental condition, comprising measuring a composition of a microbial population which has been exposed to said environmental condition, correlating said composition to a previously compiled reference data file of a plurality of compositions obtained through exposure of said microbial population to a plurality of environmental conditions and determining said environmental condition on the basis of the outcome of said correlation.
4. A method according to any one of claims 1-3, wherein said microbial population comprises bacteria, fungi and/or yeasts.
5. A method according to any one of the preceding claims, wherein said microbial population is intestinal flora or soil flora.
6. A method according to any one of the preceding claims, wherein said microbial population is a microbial population introduced into or occurring naturally in a specific process.
7. A method according to any one of the preceding claims, wherein said measurement comprises the use of taxon-specific markers.
8. A method according to claim 7, wherein said taxon-specific markers are nucleic acid markers.
9. A method according to claim 7 or 8, wherein said composition of a microbial population is determined by means of one or more microarrays.

10. A method for controlling or monitoring an environmental condition, comprising a method according to any one of claims 1-9.
11. A method for controlling a process, comprising a method according to claim 10.
- 5 12. Use of a method according to any one of claims 1-11, for quality control of water, for control of a food preparation process, for optimization of crop cultivation, for the optimization of biodegradation in the soil, for the detection of soil pollution or for the detection of undesired microorganisms.
- 10 13. Use of a method according to any one of claims 1-11, for determining a chemical substance in the soil, the air and/or in aqueous environment.